

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Eisuke WDAHARA et al.

Serial No.: 10/713,819

Filing Date: December 2, 2004

For: REINFORCING FIBER SUBSTRATE,  
COMPOSITE MATERIAL AND  
METHOD FOR PRODUCING THE  
SAME

Examiner: Andrew T. Piziali

Group Art Unit: 1771

**DECLARATION OF EISUKE WADAHARA**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Eisuke Wadahara declares under penalty of perjury under the laws of the United States of America as follows:

1. I reside at 1456, Oaza-Tsutsui, Masaki-cho, Iyo-gun, Ehime 791-3120, Japan. I received a Master of Materials Science and Engineering from Graduate School of Engineering, Nagoya University in 1996. I entered employment with Toray Industries, Inc., in 1996 and have been engaged since then mainly in research on carbon fiber fabric and carbon fiber reinforced plastic (CFRP) at Composite Materials Research Laboratories of Toray Industries Inc.(Toray). I am very familiar with the art relating to carbon fiber fabric and composites. I am a named inventor on this patent application. I have reviewed the Action of July 6, 2007.

2. I present this Declaration to further clarify the Amendment of May 24, 2007. This Declaration shows that the bonding material described in Nishimura '506 is different from an

engineering plastic having a high glass transition temperature such as "thermoplastic polyetherimide, polyphenyleneether, or polyethersulfone" as interlamina-toughening resin material of the claim 15, by showing experimental data as follows.

3. I and/or those under my direct supervision and control prepared sample using Nylon12 as interlamina-toughening resin material in a manner similar to that of Example 7 of the Specification other than a condition related to the Vf of the molded material and determined properties for comparison experiment.

Comparison Experiment

interlamina-toughening resin material: Nylon12 (Tg 37°C, mp 178°C) non-woven fabric

CAI: 188 MPa (Vf = 55%)

CS / RT: 1345 MPa (Vf = 52%)

CS / HW: 841 MPa (Vf = 52%)

All layers impregnated impregnation time = middle

Example 7

interlamina-toughening resin material: polyethersulfone-epoxy mixture (Tg 92°C, mp -) particle

CAI: 280 MPa (Vf = 58%)

CS / RT: 1630 MPa (Vf = 59%)

CS / HW: 1260 MPa (Vf = 59%)

All layers impregnated impregnation time = short.

4. Please note that by comparing the Comparison Experiment with the Example 7, using an engineering plastic having a high glass transition temperature (Tg) allows to have mechanical properties balanced at a high level as described in Claim 22.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed at Iyo-gun, Ehime, Japan, this 17 day of December, 2007.

Eisuke Wadahara  
Eisuke Wadahara